

Knowledge, Attitude and Perception of Assisted Reproductive Technology Among Patients Attending Health Clinics at Babcock University Teaching Hospital Ilishan-Remo Ogun State

Belusochi B. Joe-Ikechebelu*, Uchechi G. Okehi, Kathryn N. Onuoha, Oluwatimilehin T. Jegede, Abigail O. Asini, Idayat O. Moshood, Temitope Ashipa, and Abiodun Osinaike

Babcock University Teaching Hospital, Ilishan-Remo, Nigeria

E-mail: bikechebelu@gmail.com; okehiuchechi@gmail.com; kathrynan12@gmail.com; tjegede10@gmail.com; asiniabigail2000@gmail.com; moshoodidayat@gmail.com; ashipat@babcock.edu.ng; osinaike2015@yahoo.com

Corresponding author details: Belusochi B. Joe-Ikechebelu; bikechebelu@gmail.com

ABSTRACT

Female infertility was reported to account for about 55% of infertility cases, male factor accounted for about 30% to 40% of infertility cases and unexplained infertility accounted for the remaining 5 percent to 15 percent of cases. In Africa, infections resulting in tubo-peritoneal factor and oligo-azoospermia (low sperm count) are the most common causes of infertility. Infertility is widespread in Sub-Saharan Africa ranging from 13–17 in most countries with pockets of high prevalence at 32%. The general objective of this study is to assess the knowledge, attitude, and perception of Assisted Reproductive Technology among patients attending health clinics within the prevailing fragile health infrastructure in Nigeria. The aims of study, therefore, are to assess the knowledge of Assisted Reproductive Technology (ART) among patients attending BUTH health clinics, to ascertain the attitudes of BUTH patients towards ART as a treatment method for infertility, and to ascertain the perception of ART among patients attending clinics at BUTH. It was observed that the overall level of awareness in this study was high but with a fair knowledge level that can be attributed to the rise in social media use. Both men and women were able to correctly describe the major causes of infertility. Most importantly was the visible change in narrative against the previous belief of ART being majorly for female causes of infertility to both male and female causes. However, many participants had a negative attitude towards the use of ART and gamete donation. These findings have implications for the planning and implementation of infertility-related programmes that will help to tackle inherent challenges undermining the full utilization of ART services in Nigeria.

Keywords: ART; infertility; BUTH; low sperm count; Nigeria

(1) INTRODUCTION

(1.1) Background

Infertility is the inability of a couple to conceive children after at least one year of regular unprotected sexual intercourse. Infertility can either be Primary or Secondary Infertility. The results of the Demographic and Health Survey of Nigeria indicate that approximately 4% of women aged 30 years and above have never given birth to a child. Nigerian gynaecologists frequently report that infertility cases constitute between 50 and 70% of their consultations in tertiary health institutions¹.

Female infertility was reported to account for about 55% of infertility cases, male factor accounted for about 30% to 40% of infertility cases and unexplained infertility accounted for the remaining 5 percent to 15 percent² of cases. In Africa, infections resulting in tubo-peritoneal factor and oligo-azoospermia (low sperm count) are the most common causes of infertility².

Infertility is widespread in Sub-Saharan Africa ranging from 13–17% (Infertility Survey in 27 Sub-Saharan African Countries including Nigeria) in most countries with pockets of high prevalence at 32%. Across central Africa, such countries have been included in the 'Infertility Belt' where about 20-35 million couples are affected by the inability to give birth to a child³.

Based on previous studies, it was noted the major source of the women's awareness on IVF practice in Nigeria was from their relatives; and not from health personnel at the clinics⁴. This clearly showed that the use of Assisted Reproductive Technology such as IVF practice is low especially in rural populations. Here, the challenges of conception may continue as long as improved education and poverty reduction are not intensified⁴ with regards to the efforts made in previous studies to increase awareness of assisted reproductive techniques. Some studies encouraged education of the public through the use of mass media. This was particularly relevant in Nigeria and other developing countries to help reduce the rate of stigmatization attached to the practice of using ART as a treatment for infertility. Also, there is a need to reduce of IVF treatment cost⁴. In addition, the government at all levels should subsidize the cost of infertility treatment. Similarly, infertility and ART can be included among the conditions covered by the National Health Insurance Scheme (NHIS). Lastly, relevant NGOs and health facilities in the private sector can be encouraged to subsidize the cost of fertility treatment¹.

(1.2) Problem Statement

In 2012, a cross-sectional study on the awareness and perceptions of in-vitro fertilization practice among women attending fertility clinics in Okija, Anambra State, Nigeria

showed that the reason for a low percentage of use of ART was the cost of the procedure. Other findings from the study indicated that persons felt that this procedure was immoral as it promoted the ideology of babies as products of scientific interventions rather than human beings created by God.

Infertility prevalence is high amongst both women and men. After a long period of academic neglect, there is increasing recognition that infertility is a serious social and public health problem in Africa. However, the social and psychological impact of infertility on women in African countries remains understudied.

Persons living in Sub-Saharan Africa emphasizes the importance of children as a mark of prestige and wealth. The popular view of infertility in this region is that it constitutes a traumatic life burdened with suffering, personal grief, frustration, social stigma, rejection, ostracism, and economic deprivation for both men and women. However, women are said to experience these traumatic experiences to a far greater degree³.

Child adoption is an alternative strategy in the management of infertility aimed at assisting couples dealing with infertility child adoption. However, child adoption is not accepted openly for several reasons. These reasons include the belief that an adopted child cannot fully replace the position of their biological child. Other reasons include the fact that the adopted child could be claimed back by his/her biological parents. Finally, such children would be labeled as "illegitimate" and would not be given their share of the family's socio-cultural benefits/entitlements⁵. The general cultural stance of the majority of the ethnic groups is that marriage without procreation cannot be regarded as being blissful and so, accepting adoption is equivalent to having no child at all⁵.

In the Nigerian context infertility is more than a medical problem; it presents as multi-faceted condition encompassing reproductive impairment, cultural and religious beliefs and sociocultural expectations including gender roles³. The advent of Assisted Reproductive Technology is a measure that aids conception to fulfill the personal and societal ideals of having children. Various kinds of ART are aimed at resolving the problems of infertility. Such options include intrauterine insemination (IUI), in-vitro fertilization (IVF), gamete intrafallopian transfer (GIFT), intracytoplasmic sperm injection (ICSI), Superovulation, and timed intercourse. IVF has become a well-established treatment procedure since the birth of the first test-tube baby in 1978⁶. There are no accurate figures and proper documentation of success rates in many African countries, but in Nigeria, IVF has changed the prospect of thousands of married couples¹. The first IVF birth in sub-Saharan Africa was led by the Dapo Ashiru and Giwa-Osagie team on March 17, 1989, at the Lagos University Teaching Hospital (LUTH), Idi-Araba. Nigeria has recorded a 40% increase in IVF pregnancy success rate from 10% in the 70s to 50% in the 2010s¹.

With the need for safe pregnancy among Women Living with HIV (WLWHIV), assisted reproductive technologies (ARTs) have become central to meeting the reproductive needs of WLWHIV in resource-rich countries. ART procedures have been found to offer significant reductions in horizontal HIV transmission or coinfection for couples wishing to conceive⁷.

There are a lot of misconceptions about ART and its use. This study aims to assess the knowledge, attitude, and perception of ART among Patients attending health clinics at Babcock University Teaching Hospital.

(1.3) Justification of The Problem

The purpose of conducting the study is to assess if the level of knowledge regarding assisted reproductive technology has increased with time as compared to the previous literature studies. Nigeria as a country has witnessed some levels of development in the health sector, while also with the advancement in internet technology, more knowledge has been made available to the masses. IVF technology is still a new phenomenon in developing countries where people are still going around with the wrong perceptions about IVF. The treatment is shrouded in secrecy and stigma in Nigeria due to misconceptions, secrecy, and religious sentiments¹. Therefore, it is imperative to have adequate awareness of IVF before persons who are suffering can utilize it. The conduct of this research would help prove if more efforts are needed towards increasing awareness and knowledge about practices such as Assisted reproductive technology. Hence, if at the end of the study much has not changed between now and then, it would be safe to conclude that the information regarding such needed practice is not reaching the masses.

(1.4) Research Questions

- (1) Are patients receiving treatment in health clinics aware of Assisted Reproductive Technology as a treatment method for infertility?
- (2) What do patients attending health clinics know about Assisted Reproductive Technology?
- (3) What misconceptions do patients attending the health clinics in Babcock University Teaching Hospital have about assisted reproductive technology?
- (4) What is the attitude of patients attending health clinics towards assisted reproductive technology?

(1.5) Objectives

The general objective of this thesis is to assess the Knowledge, Attitude, and Perception of Assisted Reproductive Technology among patients attending health clinics within the prevailing fragile health infrastructure in Nigeria.

(1.6) Specific Objectives

- (1) To assess the knowledge of Assisted Reproductive Technology (ART) among patients attending BUTH health clinics.
- (2) To ascertain attitudes of BUTH patients towards ART as a treatment method for infertility
- (3) To ascertain the perception of Assisted Reproductive technology among patients attending clinics at BUTH.

(2) LITERATURE REVIEW

Infertility is considered to be of public health importance in Nigeria due to its high prevalence and social implications⁸. Reports show infertility to be the most frequent reason for gynecological consultation in Nigeria⁹. Why does infertility occur? The causes of Infertility can be explained based on male factors and female factors which are not mutually exclusive. However, it has been suggested that males and females contribute equally to infertility. Women disproportionately suffer the social and psychological consequences of infertility in Africa as compared to men⁹.

The International Conference on Population and Development Plan of Action identified the compassionate counseling and treatment of couples with infertility as an important sexual and reproductive health goal and urged countries to establish programmes for the prevention and treatment of infertility.

Although many developed countries now have programs that address infertility, very few efforts have been made by African countries in this direction⁹.

The prevention and treatment of infertility is an important unmet need in sexual and reproductive health programming in Africa, which should be addressed as a basic human and reproductive health right⁹.

Assisted Reproductive Technology is considered a method of treatment, and as such diagnosis is required to decide which method is required and more cost-effective for the couple. Diagnostic techniques include Laparoscopy and Dye test, Hysteroscopy, and Seminal Fluid Analysis (SFA) as mentioned previously in evaluating fertility.

Asides from its use in the treatment of infertility, ART is used as a method of reducing horizontal transmission of HIV in serodiscordant couples living with HIV by increasing the chance of conception and decreasing the number of "exposures" (unprotected intercourse) necessary to conceive¹⁰. Horizontal transmission is the spread of an infectious agent from one individual to another usually through contact with bodily excretions or fluids.

ART procedures significantly increase the risk of multiple gestations, both monochorionic and dichorionic, with the associated risks attributed to these pregnancies. Additionally, some studies have suggested an increased risk of chromosome abnormalities, low birth weight, and preterm delivery in singleton pregnancies achieved through assisted reproductive technology¹¹.

A major challenge to ART especially in developing countries is how to make the technology accessible, available, and affordable². Several factors can affect access to ART, such as culture, religion, political characteristics, and cost of treatment. Factors that influence access to ART services include; the nature of the healthcare system, availability of high technology services, insurance coverage, government regulations, and professional guidelines¹².

For instance, the National Health Insurance Scheme (NHIS) does not cover the investigation and treatment of infertility in Nigeria. The governments of developing countries are more concerned about limiting the high fertility rates than subsidizing infertility care.

Nevertheless, the cost of extensive laboratory workups, serial follow-up ultrasonography, strict coital rules, and unsuccessful cycles faced in the evaluation and treatment of infertility can also have a detrimental effect on the sexual life of couples¹³.

(2.1) To Ascertain the Perception of Assisted Reproductive Technology Among Patients.

Based on findings from previous studies, several factors are known to improve the perception of assisted reproductive technology as well as its awareness within a community. For instance, couples with higher educational status showed significantly higher rates of ART awareness. This suggests that as the educational level increases there is a tendency for high awareness and ART acceptability. Increased years of schooling have been shown to result in greater tolerance and acceptance of new ideas and technologies as evidenced by infertility treatments being more common among women with tertiary educational level¹⁴.

Duration of infertility was also found to significantly influence the acceptability of ART as women who had been infertile for 5 years or more were less likely to opt for ART, unlike women who had been infertile for less than 5 years¹⁴. This may reflect frustration and mistrust of medical services as infertility progresses and therefore calls for aggressive attention on new attendees.

Married women were more predisposed to support the use of ART than single respondents. This could probably be a result of stigmatization and social pressure on parenthood. It has been revealed by several studies that infertility and parenthood are highly valued in Africa to the extent that childbearing is usually considered the most important reason for marriage¹⁴.

Regarding male infertility, only a small percentage of the clients were aware that ART could be used to treat male infertility¹⁵. A study done on the level of awareness and acceptability of AID among infertile couples in Enugu, Nigeria, proved low despite the educational level of the respondents and their duration of infertility¹⁶. This is worrisome in a society where male factor infertility alone accounts for about one-third (33.3%) of the total burden of infertility, as found in this study. The women demonstrated a significantly higher rate of acceptability of Artificial Insemination by Donor (AID) than the men, probably because they are the ones who bear more of the sociocultural and psychological brunt of infertility in any traditional African society, Nigeria inclusive¹⁶.

(2.2) Attitude Toward the Use of Assisted Reproductive Technology as A Method of Treating Infertility.

Religion and profession are determinants for the attitude towards several of the ethical controversies of ART and related subjects¹⁷.

In a study among couples attending IVF and Outpatient clinic at Riyadh, Saudi Arabia, fertility drugs were significantly more acceptable to IVF patients than to fertile patients. It was interesting to find that almost all of the IVF patients accepted having a test tube baby, yet very few of the fertile outpatients were still unsure or were against this option despite its acceptance by religious dictums¹⁸. The fact infertile couples had more favorable attitudes than did fertile couples toward various interventions suggests that when couples are confronted with more information and personal necessity, their attitudes about infertility interventions become more positive¹⁸.

There was a generally positive attitude to the use of ART in the study done among Saudi couples as a majority of patients were willing to personally use ART services and recommend the same to others. This is in contrast to the study in northern Nigeria where only 7.6% of clients were willing to opt for ART. The majority felt that the utilization of ART would be increased with a reduction in cost and increased public awareness. As regards to if religion has a role to play in the acceptance of ART, previous studies show a dominant subset of women who would never consider undergoing the procedure, as more than half of them quoted their reasons as being based on their religious convictions¹⁹. Religion and occupation are play a strong role in the general attitude of a society towards ART¹⁷. It can be surmised that cultural and religious obstacles are challenges to the effective treatment of infertility in Sub-Saharan Africa¹⁹.

(2.3) To assess the level of knowledge patients attending health clinics have about ART.

Worldwide, a study compared assisted reproductive technologies in 6 European countries: France, Germany, Italy, Spain, Sweden, and United Kingdom. The study showed major acceptance of ARTs, however, an issue of concern arose being the delay in conception, especially among college-educated women. The over-optimism of IVF's success led to over-reliance on IVF as a way of compensating for infertility²⁰.

Based on previous literature about the knowledge of IVF, it was noted that the commonest source of information was from family relations while the internet was the least

common source⁴. Regarding the treatment, the majority perceived IVF treatment as too costly and unnatural. Unnatural because there is a belief that these test-tube babies are abnormal while others claimed that it is immoral to spend time and resources on extraordinary means of promoting births⁴. They noted that it will also promote babies as products rather than as human beings to be cherished in their own right. They also reported that the child may not be accepted in society⁴. When compared to undergraduates, the study showed relatively good knowledge and awareness about assisted conception and its practice in Nigeria. However, the attitude to assisted conception was not encouraging as the willingness to participate in gamete donation and surrogacy did not match the level of awareness²¹.

Utilization of IVF treatment shows that majority of the study respondents were aware of IVF but not many had used IVF which subtly implies that awareness of its existence is not the only reason why couples may not utilize the treatment¹.

Basic understanding of IVF is lacking or poor in Nigeria and many other sub-Saharan African nations. This has posed a problem to its acceptability and utilization. It appears that the respondents accepted that IVF is the last resort to overcoming infertility²². The respondents lamented the huge cost of procuring IVF treatment. In several countries government subsidization substantially reduced the out-of-pocket expense of ART treatment. For example, because of partial federal funding for an unlimited number of cycles in Australia, the average cost of a standard cycle as a percentage of disposable income decreased from 19% to 6% of average annual disposable income.²² However, it should be noted that in most countries where there is some form of government subsidy, it is limited to some cycles, and therefore patients are either fully subsidized or pay the full cost for a cycle²².

Therefore, the government should subsidize the cost of infertility treatment or include infertility and ART among the conditions covered by the National Health Insurance Scheme (NHIS). In addition, relevant NGOs and the private sector should be encouraged to subsidize the cost of fertility treatment.¹

(3) METHODOLOGY

(3.1) Study Area

This study was carried out at Babcock University Teaching Hospital, Ilishan-Remo, Ogun state. Babcock University Teaching Hospital is a tertiary health care facility with over 140 beds that caters to the student, employees and their relatives. The hospital also serves the immediate community and surrounding environment of Ogun state. The hospital consists of both single and multiple room units and shared rooms for inpatients with eleven outpatient clinics. It also serves as a tertiary referral center for 3 primary health care centers – Ikenne, Iperu, Sagamu. It provides various services such as paediatrics, orthopaedics, radiology, medicine, and surgery etc. BUTH as a tertiary hospital is involved in the training of nurses, medical doctors, medical & surgical specialists, doctors etc.

(3.2) Study Population

The study population consisted of patients attending clinics in Babcock University Teaching Hospital, Ilishan-Remo, Ogun state.

(3.3) Inclusion Criteria

Patients 18 years and above attending health clinics at the General Outpatient Department of Babcock University Teaching Hospital who have consented to participate in the study.

(3.4) Exclusion Criteria

- (1) Patients attending the health clinics at Babcock University Teaching Hospital who did not agree to participate in the study.
- (2) Patients with mental or physiological impairment that prevented them from participating in the study.

(3.5) Study Design

The study design was a descriptive cross-sectional survey.

(3.6) Sample Size

The sample size was statistically estimated and generated using the population proportion formula by Cochran as follows⁴:

$$n = \frac{z^2 P Q}{e^2}$$

where: n= sample size

Z= confidence level (95% or 1.96)

P= population proportion (or its estimate 22%)

Q= 1 - P

e= level of precision (0.05)

Therefore, the sample size is calculated thus:

$$= \frac{1.96^2 \times 0.23 \times 0.77}{0.05^2}$$

$$= 272$$

5% of the total sample size was added to accommodate for non-response

= 285

(3.7) Sampling Technique

Patients attending health clinics at GOPD BUTH who meet the inclusion criteria were recruited into the study. On each clinic day, all patients who met the inclusion criteria and who agreed to participate in the research were recruited into the study. This process was repeated at the various clinics at BUTH on each clinic day until the total sample size was achieved. This recruitment process is referred to a consecutive recruitment of the research participants.

(3.8) Method of Data Collection

Data was collected using a structured self-administered questionnaire while the interviewer remained present for any clarifications. The first 100 questionnaires were collected primarily from the reproductive health clinics of BUTH – Antenatal & Gynecology clinic. This was expanded to involve all clinics in the GOPD of BUTH to reach the sample size and to provide more representation of men in the study. The 185 questionnaires were randomly distributed amongst the various clinics based on highest patient load distribution. Data obtained was analyzed using the Statistical Package for the Social Sciences (SPSS). The interview was conducted in the native language of Yoruba or English. All questionnaires were anonymized to maintain patient privacy. Statistical analysis included frequency distribution of the responses. Data was presented as text, tables, frequencies, percentages, and charts. Descriptive statistics that computed include the mean, range and standard deviation. Inferential statistics to be computed include Hypothesis Test. For easy classification of respondents' knowledge, a subjective scoring system was used. Each item under the knowledge section was scored accordingly. The correct option was accredited a score of 2, the incorrect option, a score of 1 and I don't know, a score of 0. The total score for each respondent was calculated by adding all of these together (percentage frequency for knowledge scores).

(3.9) Study Limitations

The limitations of this study include;

- Improper understanding of the Questions asked.
- Lack of interest in the topic.

(3.10) Ethical Considerations

Approval for the study was obtained from the Department of Community Medicine, Benjamin Carson Snr. School of Medicine. In Addition, ethical clearance from the Babcock University Health Research Ethics Committee will be obtained.

Informed consent was obtained from patients and participants before administering questionnaires Benefit to research participants: The benefits of the study to research participants include increased awareness and knowledge about assisted reproduction to help couples in need.

A leaflet prepared by the group was given to each participant that completed the questionnaire). The leaflet explained terms like ART, the benefits, possible side effects, and locations where the service can be obtained.

Confidentiality: To maintain patient confidentiality, a code number was assigned to each questionnaire which will be highly confidential. After the research, the questionnaires will be shredded and disposed of Risk of harm to research participants There will be no risk or harm associated with participating in the study.

(4) RESULTS

A total of 300 questionnaires were distributed for this study, out of which 270 were properly filled. 30 questionnaires were either not returned or inaccurately filled and discarded. This resulted in a 90% response rate.

TABLE 1: socio-demographic characteristics of respondents.

Socio-Demographic Characteristics	N	%
Sex		
Female	189	70
Male	81	30
Marital status		
Single	76	28.2
Married	191	70.7
Widow	2	0.7
Divorced	1	0.4
Separated	0	0.0
Age		
<20	13	4.8
20-39	201	74.4
40-59	50	18.6
>60	4	1.5
Not indicated	2	0.7
Mean Age ± SD	33.8 ± 23.8 years	
Religion		
Christianity	232	86.0
Islam	36	13.3
Tribe		
Igbo	59	21.9
Yoruba	176	65.2
Employment status		
Employed	191	70.7
Student	59	21.9
Unemployed	16	5.9
Estimated Monthly income		
< ₦100,000	56	20.8
> ₦501,000	13	4.8
Not indicated	124	45.9

The mean age of the respondents was 33.8 ±23.8 years. The majority are females 189 (70%), married 191(70.7%), are between the ages of 20-39 201(74.4%), Christian by religion 232(86%), 176(65.2%) were Yoruba and are employed 191(70.7%). About two-tenth (20.8%) earn less

than ₦100,000 in a month. Out of 194 participants who were married, 104(53.6%) had less than 5 years of marriage, about 68.8% have had a pregnancy before.

TABLE 2: Causes of infertility identified by respondents.

Causes	N	%
Sperm abnormality	201	74.4
Sexually transmitted diseases	172	63.7
Previous abortions	164	60.7
Stress	161	59.6
Lifestyle e.g. cigarette smoking	140	51.8
Previous use of contraceptive devices	139	51.5
Alcohol consumption	130	48.1
Spiritual attack	90	33.3
Enemies	42	15.6
Curse from the ancestors	34	12.6

Table 2 shows the causes of infertility reported by the respondents. The commonest cause of infertility identified were sperm abnormality (74.4%) which is followed closely by sexually transmitted diseases (63.7%) and previous abortion (60.7%).

TABLE 3: Knowledge and Awareness of ART.

*Source of information	N	%
Mass media	125	35.2
Health facility	123	34.6
Friends	57	16.1
Family	50	14.1
Methods		
In vitro fertilization	199	37.7
Intra uterine insemination	127	24.1
Ovulation Induction	113	21.4
Artificial insemination	89	16.9
Complications		
Multiple pregnancies	127	47.0
Miscarriages	117	43.3
Premature Delivery	98	36.3
Bleeding	86	31.9
Abnormalities in the Baby	66	24.4
Indications		
Both (Combined Male and Female Infertility)	211	78.1
I Don't Know	34	12.6
Female Infertility	18	6.7
Male Infertility	3	1.1
None	4	1.5

Majorly owned by	N	%
Private Owned	129	47.8
Government owned	3	1.1
Both	84	31.1
Don't Know	54	20.0

*Multiple responses allowed.

Table 3, Source of information about assisted reproductive technology, almost equal number of respondents chose mass media 125(35.2%) and health facilities 123(34.6%) as their source of information while In-vitro fertilization 199(37.7%) is the popular method and multiple pregnancies 127(47%) as the commonest complication of Assisted Reproductive Technology.

Also, most respondents indicated both male and female infertility 211(78.1%) as the cause for Assisted Reproductive Technology, which are majorly owned by private organizations 129(47.8%).

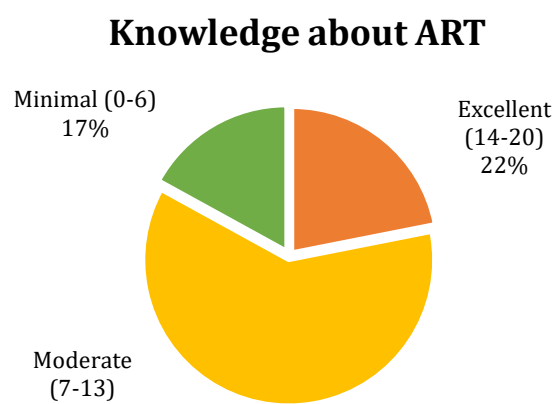


FIGURE 1: Knowledge of respondents on knowledge of assisted reproductive technology.

The knowledge score was divided into three categories: Excellent (>14 of the maximum possible total score), Fair (7-13 of the highest possible total score), and minimal (<6 of the maximum possible total score). 21.9% had excellent knowledge about ART, 61.1% had moderate while only 17.0% had minimal knowledge (Figure 1)

TABLE 4: Attitude of respondents on using Assisted Reproductive Technology.

	Yes (%)	No (%)	Don't know (%)
Would you be willing to use any of these methods to achieve pregnancy	90 (33.3)	110 (40.7)	70 (25.9)
Would you be willing to receive Ova or Sperm from someone else to achieve a pregnancy	51 (18.9)	158 (58.5)	61 (22.6)
Would you be willing to donate your sperm or Ova to help another couple achieve pregnancy	84 (31.1)	116 (43.0)	70 (25.9)

Table 4 shows that 110(40.7%) would not be willing to use any of the ART methods to achieve pregnancy. About 158(58.5%) claimed they would not want to receive ova or sperm from someone else to achieve a pregnancy. 116(43.0%) were not willing to donate their sperm or Ova to help another couple achieve pregnancy.

TABLE 5: Perception and Practice of Assisted Reproductive Technology as a method of treating infertility.

Perceptions	Yes N (%)	No N (%)	Don't know N (%)
Couples struggling with pregnancy should use ART.	211(78.1)	17(6.3)	42(15.6)
Couples fear rejection by the society if they use ART.	96(35.6)	93(34.4)	81(30.0)
The cost of ART is very expensive.	198(73.3)	6(2.2)	66(24.4)
Using ART as a method of conception is safe.	144(53.3)	23(8.5)	103(38.2)
The cost of ART should be taken care of by the government.	137(50.7)	49(18.2)	84(31.1)
ART should be accepted by members of the community.	204(75.6)	9(3.3)	57(20.9)
Babies delivered via ART are normal babies.	201(74.4)	10(3.7)	59(21.9)
Babies delivered via ART are abnormal babies.	14(5.2)	166(61.5)	90(33.3)
All healthcare facilities should offer ART?	155(57.4)	46(17.0)	69(25.6)
Information about it should be available to all healthcare providers.	218(80.7)	9(3.3)	43(15.9)
The cost of ART should be subsidized by the government	201(74.4)	14(5.2)	55(20.4)

Table 5 shows that majority agreed that couples struggling with pregnancy should use ART 211(78.1) while 198(73.3%) agreed ART is very expensive. About 204(75.6%) agreed that ART should be accepted by members of the community, 201(61.5%) agreed that babies delivered via ART are normal babies. Also, 218(80.7%) agreed that information about ART should be available to all health care providers while 201(74.4) agreed that the cost of ART should at least be subsidized by

the government. However, about half of the respondents believed the cost of ART should be taken care of by the government 137(50.7%). 144(53.3%) believed using ART as a form of contraception is safe.

(5) DISCUSSION

This is a study about the Knowledge, attitude and Perception of Assisted Reproductive techniques among patients attending health clinics in Babcock University Teaching Hospital. The mean age of the study was 33.8 ± 23.8 years. The majority of respondents were females 189 (70%); this finding is similar to that reported by Akande et al. in a study in Ibadan²³. The preponderance of female in our sample was partly due to the men declining the questionnaire regarding it as more of a “women issue”.

Knowledge plays a major role in decision-making. To be well informed is to be knowledgeable about a fact or a situation. The findings in this study revealed 230(85.2%) awareness level of ART approaching the over 90% obtained in developed countries. This proportion is an improvement over the 73.0% and 76.5% awareness level reported in Benin and Zaria respectively^{2,24} but lower than a study reported in Northern Nigeria with an awareness level of 90.3%²¹. Furthermore, there were variations in the knowledge about the different services/options offered by ART. Over 37% of the respondents were more aware about In-Vitro Fertilization (IVF) while lower rates were recorded for Artificial Insemination (16.9%). However, it was noticed that IVF was seen as a more general term ovulation induction and intrauterine insemination.

The knowledge score showed that three-fifths of our respondents had a fair knowledge on ART. This may be attributable to the increased availability of ART clinics across the country and wider access to social media/internet. This study was amongst a much younger age bracket well up-to-date with social media thereby accounting for our finding of increased awareness via this source compared to a study in Anambra which cited friends and family as the major source⁴. The social media is increasingly becoming an avenue for promoting preventive and intervention strategies for public health and efforts must be made to enhance the utilization of modern communication media²¹

In addition to that, majority of respondents in this study identified sperm abnormality as a cause of infertility and indicated that male and female infertility could be addressed by ART. This was not so in the findings by Omokanye *et al*¹⁵ where female fertility was indicated and only a small percentage of the clients were aware that ART could be used to treat male infertility.

Most respondents had surface knowledge of the techniques but unaware of the complications. However, what was clear to most was that it was expensive and not always successful.

In this study, only 33.3% showed willingness to use any ART method to achieve pregnancy unlike the 79.9% expressing willingness to accept the procedure of IVF and the resulting offspring should the procedure be offered by their doctor in the study by Aziken *et al*²⁵. Reasons could range from cost, stigma or religion. It seems that despite the high awareness and fair knowledge, there is a disproportionate among of respondents not willing to use ART.

A major challenge to the utilization of ART services in Nigeria is cost. In all studies regarding ART, all respondents had similar opinions on ART being expensive. In Nigeria, a cycle of IVF costs between #500,000 to #3,000,000 depending on the facility.

Additional costs are incurred for techniques such as intracytoplasmic sperm injection and the use of gamete donors¹⁵. This would mean that on average only 1 in 20 of our respondents could afford ART without running into a financial burden.

Similarly, majority of the respondents were not favourably disposed to the use of donor sperm insemination (DSI), a method which allows the third party to donate sperms for those in need. It is therefore not surprising that almost all respondents were not willing to serve as egg donors. This finding is in disagreement with what was found by Adesiyun *et al*² where most male respondents had the intention to donate sperms.

The willingness to participate in gamete donation did not match the knowledge or awareness of ART. It could be because of concern about the genetic makeup of the donor and risk of stigmatization of the offspring or due to health considerations, moral concerns, and inadequate information as depicted in the study by Ogunbode *et al*²¹. This replicates the desire in the average African couple to be seen as being able to conceive and be genetically compatible with their children.

Regarding the perception, 74% of the respondents indicated that babies conceived through IVF are normal similar to another study in Benin with 70.1%²⁵ unlike the study in Anambra which the respondents claimed that it unnatural because there is a belief that these test-tube babies are abnormal while others claimed that it is immoral to spend time and resources on extraordinary means of promoting births⁴.

Nevertheless, having children is a reproductive right. And, the demand for a more affordable alternative is clearly seen with the high rise in informal industries such as Baby factories and child trafficking. Two reasons for this is to receive societal acknowledgement that they are productive and not barren, thus liberating themselves from the innuendoes and deprivations associated with infertility. Second is to protect the child from the stigma and social label that adopted children usually encounter²⁶. Child adoption is not a popular alternative to infertility majorly due to cultural reasons. However, ART was once frowned upon but now the outlook is different due to the awareness made. Similarly, the formulation and subsequent dissemination of the adoption law in Nigeria will further reassure the desiring couples. Involvement of all stakeholders especially community, traditional, religious and political leaders including women groups should be co-opted at all stages to achieve a more robust law that will accommodate all views including protection against any cultural barriers⁵.

There's still more to be done by the government and healthcare providers regarding the knowledge about ART. However, it can be confidently said that we have come a long way in the level of awareness.

(6) CONCLUSION

The overall level of awareness in this study is high but with a fair knowledge level that can be attributed to the rise in social media use. Both men and women were able to correctly describe the major causes of infertility. Most importantly was the visible change in narrative against the previous belief of ART being majorly for female causes of infertility to both male and female causes. However, many participants had a negative attitude towards the use of ART and gamete donation. These findings have implications for the planning and implementation of infertility-related programmes that will help to tackle inherent challenges undermining the full utilization of ART services in Nigeria.

Public education campaigns should be directed toward correcting erroneous beliefs about the risk factors associated with infertility.

(7) RECOMMENDATION

To the government, we recommend

- A census be taken for a more updated statistic as to the population growth and what stage of demographic transition the country is in. This is important in the allocation of resources.
- Allocation of funds to Non-Governmental Organizations (NGO) and Health insurance schemes. Also, proper maintenance of government hospitals that run assisted reproductive procedures.

To the community, let us teach each other to focus on the greater good achieved through adoption rather than bring down information. Every child deserves the right to grow up in a good home with their needs catered for.

- Primary health care cannot offer ART services but with a proper referral system, adequate can be given and the necessary help acquired.
- Within this community are the religious organizations, the churches and the mosques. One isn't blind to the influence religion has on matters as such. Therefore, this influence can go a long way in eliminating the stigma around ART and adoption.

To the individuals, educate yourselves and ask questions. Refrain from spreading myths that are not proven.

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